



ALS Environmental
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August 17, 2017

Analytical Report for Service Request No: K1707937

Lynda Lombardi
AMEC Foster Wheeler Environment & Infrastructure Inc.
10940 White Rock Road
Suite 190
Rancho Cordova, CA 95670

RE: Leviathan Mine RI/FS / 0013091150

Dear Lynda,

Enclosed are the results of the sample(s) submitted to our laboratory July 28, 2017
For your reference, these analyses have been assigned our service request number **K1707937**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

A handwritten signature in black ink, appearing to read "Noel D. Dow".

for Kelley Lovejoy
Project Manager



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Table of Contents

- Acronyms
- Qualifiers
- State Certifications, Accreditations, And Licenses
- Case Narrative
- Chain of Custody
- Total Solids
- Metals

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdpb.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.alsglobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
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ALS ENVIRONMENTAL

Client: AMEC Foster Wheeler E & I (Geomatrix) **Service Request No.:** K1707937
Project: Leviathan Mine RI/FS/0013091150 **Date Received:** 07/28/17
Sample Matrix: Soil

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Matrix/Duplicate Matrix Spike (MS/DMS).

Sample Receipt

Four soil samples were received for analysis at ALS Environmental on 07/28/17. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Total Metals

Relative Percent Difference Exceptions:

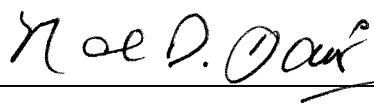
The Relative Percent Difference (RPD) for the replicate analysis of Cobalt, Lead, Manganese, and Thallium in the Batch QC sample was outside the normal ALS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

Matrix Spike Recovery Exceptions:

Antimony recoveries are generally low for soil and sediment samples when digested using EPA Method 3050B. Despite anticipated low recoveries, the method is still generally prescribed because of its versatility for general metals analysis. Antimony results (in conjunction with the matrix spike recovery) from this procedure should only be used as indicators to estimate concentrations. The matrix spike recoveries of Antimony for the Batch QC sample was below the ALS control criterion. Since low recoveries resulted from a method defect and were possibly magnified by certain matrix components, no corrective action was appropriate. Alternative procedures that specifically target Antimony are available but were not specified for this project. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicated the analysis was in control.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____





Chain of Custody

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Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: Leviathan Mine RI/FS
 BP/ARC Facility No:

Req Due Date (mm/dd/yy):
 Lab Work Order Number:

K1707937
 Page 1 of 1

Rush TAT: Yes No

Lab Name: ALS Environmental				BP/ARC Facility Address: Leviathan Mine								Consultant/Contractor: Amec Foster Wheeler											
Lab Address: 1317 South 13th Avenue, Kelso, WA 98626				City, State, ZIP Code: Alpine County, California								Consultant/Contractor Project No: 0013091150											
Lab PM: Kelley Lovejoy				Lead Regulatory Agency: U.S. EPA Region IX								Address: 10840 White Rock Rd, Ste 190, Rancho Cordova, CA 95670											
Lab Phone: 360-577-7222				California Global ID No.:								Consultant/Contractor PM: Marc Lombardi											
Lab Shipping Acct: 1102-6855-6 (ALS Acct #)				Enfos Proposal No: D013P-0019 Work Release No: 312836								Phone: 916-636-3200											
Lab Bottle Order No:				Accounting Mode: Provision <input checked="" type="checkbox"/> OOC-BU <input type="checkbox"/> OOC-RM <input type="checkbox"/>								Email Report/EDD To: joseph.samoy@amecwf.com											
Other Info: River Ranch Soil Investigation				Stage: 4-Execute Activity: Spend								Invoice To: BP/ARC <input checked="" type="checkbox"/> Contractor <input type="checkbox"/>											
BP/ARC EBM: Anthony Brown				Matrix		No. Containers / Preservative						Requested Analyses				Report Type & QC Level							
EBM Phone: 714-228-6770																Standard <input checked="" type="checkbox"/>							
EBM Email: anthony.brown@bp.com																Full Data Package <input type="checkbox"/>							
Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor	Total Number of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	Metals ¹ (SW 6010B/6020A)	Mercury (SW 7471B/7470A)	Hexavalent Chromium (SW 7196A)	Soil pH (SW 9045D)	Soil Conductivity (SW 9050A Mod.)	TOC (EPA Lkhan Method)	Total Solids	HOLD	MS/MSD	Comments		
																				Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.			
SBS07271105	1/27/17	1455	X				1	X				X	X								'Metals are: Al, Fe, Zn by 6010B;		
SBS07271106	1/27/17	1458	X				1	X				X	X								As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn,		
SBS07271107	1/27/17	1501	X				1	X				X	X								Ni, Sb, Se, Ag, Ti, V by 6020A		
SBS07271108	1/27/17	1505	X				1	X				X	X								Report soil on dry weight basis.		
Sampler's Name: Joe Gonzales				Relinquished By / Affiliation								Date	Date	Accepted By / Affiliation				Date	Date				
Sampler's Company: Amec Foster Wheeler				Joe (AFW)								7/27/17	(600)	Troy Goldsmith				7-27	1600				
Shipment Method: FedEx				Ship Date: 1/27/17								7-27	1600	Troy Goldsmith				7/28	0930				
Shipment Tracking No: 811288913020																							
Special Instructions:																							
THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No				Temp Blank: Yes / No				Cooler Temp on Receipt: 80°F/88°F				°F/C				Trip Blank: Yes / No				MS/MSD Sample Submitted: Yes / No			

ED_001709_00001179-00009



PC Kelly

Cooler Receipt and Preservation Form

Client ANECService Request K17 07937Received: 07/28/17 Opened: 07/28/17 By: JW Unloaded: 07/28/17 By: JW1. Samples were received via? USPS FedEx UPS DHL PDX Courier Hand Delivered2. Samples were received in: (circle) Cooler Box Envelope Other NA3. Were custody seals on coolers? NA Y N If yes, how many and where? In front & backIf present, were custody seals intact? Y N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
1.6	1.8	—	—	+0.2	349	NA	811288913620		

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* If applicable, tissue samples were received: Frozen Partially Thawed Thawed NA Y N7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? *Indicate in the table below.* NA Y N11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Votes, Discrepancies, & Resolutions: _____



Total Solids

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1707937
Date Collected: 07/27/17
Date Received: 07/28/17
Units: Percent
Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
SBS07271705	K1707937-001	100	-	-	1	07/31/17 17:22	
SBS07271706	K1707937-002	100.0	-	-	1	07/31/17 17:22	
SBS07271707	K1707937-003	100.0	-	-	1	07/31/17 17:22	
SBS07271708	K1707937-004	100	-	-	1	07/31/17 17:22	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Collected: 07/27/17
Date Received: 07/28/17
Date Analyzed: 07/31/17

Replicate Sample Summary**Inorganic Parameters**

Sample Name:	SBS07271705	Units:	Percent
Lab Code:	K1707937-001	Basis:	As Received
Duplicate Sample K1707937- 001DUP Result			
Analyte Name	Analysis Method	MRL	Sample Result
Solids, Total	160.3 Modified	-	100
			100.0
			Average
			100.0
			RPD
			<1
			RPD Limit
			20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



Metals

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: SBS07271705
Lab Code: K1707937-001

Service Request: K1707937
Date Collected: 07/27/17 14:55
Date Received: 07/28/17 09:30

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6010C	1430	mg/Kg	2.0	0.5	2	08/09/17 14:12	08/01/17	
Antimony	6020A	18.1	mg/Kg	0.049	0.010	5	08/03/17 14:05	08/01/17	
Arsenic	6020A	62.2	mg/Kg	0.49	0.04	5	08/03/17 14:05	08/01/17	
Barium	6010C	185	mg/Kg	0.79	0.30	2	08/09/17 14:12	08/01/17	
Beryllium	6020A	0.167	mg/Kg	0.020	0.005	5	08/03/17 14:05	08/01/17	
Cadmium	6020A	59.9	mg/Kg	0.039	0.007	5	08/03/17 14:05	08/01/17	
Chromium	6020A	877	mg/Kg	0.20	0.06	5	08/03/17 14:05	08/01/17	
Cobalt	6020A	73.3	mg/Kg	0.039	0.006	5	08/03/17 14:05	08/01/17	
Copper	6010C	3510	mg/Kg	0.79	0.30	2	08/09/17 14:12	08/01/17	
Iron	6010C	11400	mg/Kg	3.9	2.0	2	08/09/17 14:12	08/01/17	
Lead	6020A	60.1	mg/Kg	0.049	0.020	5	08/03/17 14:05	08/01/17	
Manganese	6010C	199	mg/Kg	0.20	0.02	2	08/09/17 14:12	08/01/17	
Mercury	7471B	0.393	mg/Kg	0.019	0.002	1	08/04/17 11:57	08/03/17	
Nickel	6020A	875	mg/Kg	0.20	0.03	5	08/03/17 14:05	08/01/17	
Selenium	6020A	1.95	mg/Kg	0.99	0.07	5	08/03/17 14:05	08/01/17	
Silver	6020A	1.76	mg/Kg	0.020	0.004	5	08/03/17 14:05	08/01/17	
Thallium	6020A	0.052	mg/Kg	0.020	0.002	5	08/03/17 14:05	08/01/17	
Vanadium	6020A	29.1	mg/Kg	0.20	0.02	5	08/03/17 14:05	08/01/17	
Zinc	6010C	112	mg/Kg	0.99	0.20	2	08/09/17 14:12	08/01/17	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: SBS07271706
Lab Code: K1707937-002

Service Request: K1707937
Date Collected: 07/27/17 14:58
Date Received: 07/28/17 09:30

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6010C	1430	mg/Kg	1.9	0.5	2	08/09/17 14:15	08/01/17	
Antimony	6020A	18.0	mg/Kg	0.048	0.010	5	08/03/17 14:09	08/01/17	
Arsenic	6020A	62.0	mg/Kg	0.48	0.04	5	08/03/17 14:09	08/01/17	
Barium	6010C	162	mg/Kg	0.77	0.29	2	08/09/17 14:15	08/01/17	
Beryllium	6020A	0.150	mg/Kg	0.019	0.005	5	08/03/17 14:09	08/01/17	
Cadmium	6020A	56.2	mg/Kg	0.038	0.007	5	08/03/17 14:09	08/01/17	
Chromium	6020A	852	mg/Kg	0.19	0.06	5	08/03/17 14:09	08/01/17	
Cobalt	6020A	63.8	mg/Kg	0.038	0.006	5	08/03/17 14:09	08/01/17	
Copper	6010C	3760	mg/Kg	0.77	0.29	2	08/09/17 14:15	08/01/17	
Iron	6010C	11900	mg/Kg	3.8	1.9	2	08/09/17 14:15	08/01/17	
Lead	6020A	48.7	mg/Kg	0.048	0.019	5	08/03/17 14:09	08/01/17	
Manganese	6010C	204	mg/Kg	0.19	0.02	2	08/09/17 14:15	08/01/17	
Mercury	7471B	0.407	mg/Kg	0.020	0.002	1	08/04/17 11:58	08/03/17	
Nickel	6020A	821	mg/Kg	0.19	0.03	5	08/03/17 14:09	08/01/17	
Selenium	6020A	1.93	mg/Kg	0.96	0.07	5	08/03/17 14:09	08/01/17	
Silver	6020A	1.90	mg/Kg	0.019	0.004	5	08/03/17 14:09	08/01/17	
Thallium	6020A	0.055	mg/Kg	0.019	0.002	5	08/03/17 14:09	08/01/17	
Vanadium	6020A	25.9	mg/Kg	0.19	0.02	5	08/03/17 14:09	08/01/17	
Zinc	6010C	115	mg/Kg	0.96	0.19	2	08/09/17 14:15	08/01/17	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: SBS07271707
Lab Code: K1707937-003

Service Request: K1707937
Date Collected: 07/27/17 15:01
Date Received: 07/28/17 09:30

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6010C	1400	mg/Kg	1.9	0.5	2	08/09/17 14:18	08/01/17	
Antimony	6020A	15.9	mg/Kg	0.048	0.010	5	08/03/17 14:12	08/01/17	
Arsenic	6020A	58.6	mg/Kg	0.48	0.04	5	08/03/17 14:12	08/01/17	
Barium	6010C	164	mg/Kg	0.77	0.29	2	08/09/17 14:18	08/01/17	
Beryllium	6020A	0.141	mg/Kg	0.019	0.005	5	08/03/17 14:12	08/01/17	
Cadmium	6020A	53.6	mg/Kg	0.039	0.007	5	08/03/17 14:12	08/01/17	
Chromium	6020A	808	mg/Kg	0.19	0.06	5	08/03/17 14:12	08/01/17	
Cobalt	6020A	63.8	mg/Kg	0.039	0.006	5	08/03/17 14:12	08/01/17	
Copper	6010C	3400	mg/Kg	0.77	0.29	2	08/09/17 14:18	08/01/17	
Iron	6010C	11400	mg/Kg	3.9	1.9	2	08/09/17 14:18	08/01/17	
Lead	6020A	47.0	mg/Kg	0.048	0.019	5	08/03/17 14:12	08/01/17	
Manganese	6010C	198	mg/Kg	0.19	0.02	2	08/09/17 14:18	08/01/17	
Mercury	7471B	0.483	mg/Kg	0.0097	0.0010	1	08/04/17 12:00	08/03/17	
Nickel	6020A	780	mg/Kg	0.19	0.03	5	08/03/17 14:12	08/01/17	
Selenium	6020A	1.70	mg/Kg	0.97	0.07	5	08/03/17 14:12	08/01/17	
Silver	6020A	1.96	mg/Kg	0.019	0.004	5	08/03/17 14:12	08/01/17	
Thallium	6020A	0.043	mg/Kg	0.019	0.002	5	08/03/17 14:12	08/01/17	
Vanadium	6020A	25.1	mg/Kg	0.19	0.02	5	08/03/17 14:12	08/01/17	
Zinc	6010C	107	mg/Kg	0.97	0.19	2	08/09/17 14:18	08/01/17	

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Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: SBS07271708
Lab Code: K1707937-004

Service Request: K1707937
Date Collected: 07/27/17 15:05
Date Received: 07/28/17 09:30

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6010C	1410	mg/Kg	1.9	0.5	2	08/09/17 14:21	08/01/17	
Antimony	6020A	16.8	mg/Kg	0.047	0.009	5	08/03/17 14:16	08/01/17	
Arsenic	6020A	55.4	mg/Kg	0.47	0.04	5	08/03/17 14:16	08/01/17	
Barium	6010C	169	mg/Kg	0.74	0.28	2	08/09/17 14:21	08/01/17	
Beryllium	6020A	0.145	mg/Kg	0.019	0.005	5	08/03/17 14:16	08/01/17	
Cadmium	6020A	52.7	mg/Kg	0.037	0.007	5	08/03/17 14:16	08/01/17	
Chromium	6020A	781	mg/Kg	0.19	0.06	5	08/03/17 14:16	08/01/17	
Cobalt	6020A	64.2	mg/Kg	0.037	0.006	5	08/03/17 14:16	08/01/17	
Copper	6010C	3500	mg/Kg	0.74	0.28	2	08/09/17 14:21	08/01/17	
Iron	6010C	11500	mg/Kg	3.7	1.9	2	08/09/17 14:21	08/01/17	
Lead	6020A	51.7	mg/Kg	0.047	0.019	5	08/03/17 14:16	08/01/17	
Manganese	6010C	198	mg/Kg	0.19	0.02	2	08/09/17 14:21	08/01/17	
Mercury	7471B	0.486	mg/Kg	0.019	0.002	1	08/04/17 12:02	08/03/17	
Nickel	6020A	748	mg/Kg	0.19	0.03	5	08/03/17 14:16	08/01/17	
Selenium	6020A	1.77	mg/Kg	0.93	0.07	5	08/03/17 14:16	08/01/17	
Silver	6020A	2.53	mg/Kg	0.019	0.004	5	08/03/17 14:16	08/01/17	
Thallium	6020A	0.048	mg/Kg	0.019	0.002	5	08/03/17 14:16	08/01/17	
Vanadium	6020A	26.0	mg/Kg	0.19	0.02	5	08/03/17 14:16	08/01/17	
Zinc	6010C	108	mg/Kg	0.93	0.19	2	08/09/17 14:21	08/01/17	

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Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1710703-03

Service Request: K1707937
Date Collected: NA
Date Received: NA

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6010C	0.5 J	mg/Kg	2	0.5	2	08/09/17 13:30	08/01/17	
Antimony	6020A	ND U	mg/Kg	0.05	0.010	5	08/03/17 13:19	08/01/17	
Arsenic	6020A	ND U	mg/Kg	0.5	0.04	5	08/03/17 13:19	08/01/17	
Barium	6010C	ND U	mg/Kg	0.8	0.30	2	08/09/17 13:30	08/01/17	
Beryllium	6020A	ND U	mg/Kg	0.020	0.005	5	08/03/17 13:19	08/01/17	
Cadmium	6020A	ND U	mg/Kg	0.040	0.007	5	08/03/17 13:19	08/01/17	
Chromium	6020A	ND U	mg/Kg	0.20	0.06	5	08/03/17 13:19	08/01/17	
Cobalt	6020A	ND U	mg/Kg	0.040	0.006	5	08/03/17 13:19	08/01/17	
Copper	6010C	ND U	mg/Kg	0.8	0.30	2	08/09/17 13:30	08/01/17	
Iron	6010C	ND U	mg/Kg	4	2.0	2	08/09/17 13:30	08/01/17	
Lead	6020A	ND U	mg/Kg	0.05	0.020	5	08/03/17 13:19	08/01/17	
Manganese	6010C	ND U	mg/Kg	0.2	0.02	2	08/09/17 13:30	08/01/17	
Nickel	6020A	ND U	mg/Kg	0.20	0.03	5	08/03/17 13:19	08/01/17	
Selenium	6020A	ND U	mg/Kg	1.0	0.07	5	08/03/17 13:19	08/01/17	
Silver	6020A	ND U	mg/Kg	0.020	0.004	5	08/03/17 13:19	08/01/17	
Thallium	6020A	ND U	mg/Kg	0.020	0.002	5	08/03/17 13:19	08/01/17	
Vanadium	6020A	ND U	mg/Kg	0.20	0.02	5	08/03/17 13:19	08/01/17	
Zinc	6010C	ND U	mg/Kg	1.0	0.2	2	08/09/17 13:30	08/01/17	

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Analytical Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1710724-01

Service Request: K1707937
Date Collected: NA
Date Received: NA

Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7471B	ND U	mg/Kg	0.02	0.002	1	08/04/17 11:37	08/03/17	

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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Collected: NA
Date Received: NA
Date Analyzed: 08/03/17 - 08/09/17

Replicate Sample Summary

Total Metals

Sample Name: Batch QC **Units:** mg/Kg
Lab Code: K1707930-001 **Basis:** Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample		RPD	RPD Limit
					KQ1710703-05	Result		
Aluminum	6010C	2.0	0.5	12700	13200	13000	4	20
Antimony	6020A	0.051	0.010	0.174	0.211	0.193	19	20
Arsenic	6020A	0.51	0.04	21.0	24.3	22.7	15	20
Barium	6010C	0.81	0.30	108	112	110	4	20
Beryllium	6020A	0.020	0.005	0.628	0.645	0.637	3	20
Cadmium	6020A	0.041	0.007	0.969	1.06	1.01	9	20
Chromium	6020A	0.20	0.06	5.24	4.78	5.01	9	20
Cobalt	6020A	0.041	0.006	21.6	41.5	31.6	63 *	20
Copper	6010C	0.81	0.30	123	132	128	7	20
Iron	6010C	4.1	2.0	29100	29700	29400	2	20
Lead	6020A	0.051	0.020	14.9	21.1	18.0	34 *	20
Manganese	6010C	0.20	0.02	497	1170	834	81 *	20
Nickel	6020A	0.20	0.03	13.4	15.6	14.5	15	20
Selenium	6020A	1.0	0.07	0.4 J	0.4 J	0.4	3	20
Silver	6020A	0.020	0.004	0.087	0.097	0.092	11	20
Thallium	6020A	0.020	0.002	0.227	0.290	0.259	25 *	20
Vanadium	6020A	0.20	0.02	34.5	36.2	35.4	5	20
Zinc	6010C	1.0	0.2	80.3	73.2	76.8	9	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Collected: NA
Date Received: NA
Date Analyzed: 08/04/17

Replicate Sample Summary**Total Metals**

Sample Name: Batch QC **Units:** mg/Kg
Lab Code: K1707930-001 **Basis:** Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	KQ1710724-03	Average	RPD	RPD Limit
					Result				
Mercury	7471B	0.020	0.002	0.005 J	0.006 J	0.006	23 #		20

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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Collected: NA
Date Received: NA
Date Analyzed: 08/04/17

Replicate Sample Summary**Total Metals**

Sample Name: Batch QC **Units:** mg/Kg
Lab Code: K1707991-001 **Basis:** Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	KQ1710724-06	Average	RPD	RPD Limit
					Result				
Mercury	7471B	0.029	0.003	0.020 J	ND U	ND	-	-	20

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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request:K1707937
Date Collected:N/A
Date Received:N/A
Date Analyzed:08/03/17 - 08/09/17

Duplicate Matrix Spike Summary
Total Metals

Sample Name:	Batch QC		Units: mg/Kg
Lab Code:	K1707930-001		Basis: Dry

Analyte Name	Method	Sample Result	Matrix Spike KQ1710703-01				Duplicate Matrix Spike KQ1710703-02				
			Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Aluminum	6010C	12700	13400	384	201 #	12500	411	-29 #	75-125	7	20
Antimony	6020A	0.174	40.6	96.0	42 N	44.1	103	43 N	75-125	8	20
Arsenic	6020A	21.0	127	96.0	110	133	103	109	75-125	5	20
Barium	6010C	108	302	192	101	327	206	107	75-125	8	20
Beryllium	6020A	0.628	10.2	9.60	100	11.4	10.3	105	75-125	11	20
Cadmium	6020A	0.969	11.4	9.60	109	12.0	10.3	107	75-125	5	20
Chromium	6020A	5.24	46.7	38.4	108	50.3	41.1	110	75-125	8	20
Cobalt	6020A	21.6	139	96.0	123	135	103	110	75-125	3	20
Copper	6010C	123	179	47.9	116	179	51.3	108	75-125	<1	20
Iron	6010C	29100	31700	192	1344 #	31400	206	1145 #	75-125	<1	20
Lead	6020A	14.9	120	96.0	110	127	103	109	75-125	6	20
Manganese	6010C	497	816	96.0	333 #	605	103	106 #	75-125	30*	20
Nickel	6020A	13.4	116	96.0	107	122	103	106	75-125	5	20
Selenium	6020A	0.37 J	96.8	96.0	100	108	103	105	75-125	11	20
Silver	6020A	0.087	10.1	9.60	104	10.8	10.3	105	75-125	8	20
Thallium	6020A	0.227	19.7	19.2	101	21.3	20.6	102	75-125	8	20
Vanadium	6020A	34.5	144	96.0	114	154	103	116	75-125	7	20
Zinc	6010C	80.3	169	96.0	92	168	103	86	75-125	<1	20

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 8/14/2017 11:55:42 AM

Superset Reference:

ALS Group USA, Corp.
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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Collected: N/A
Date Received: N/A
Date Analyzed: 08/4/17
Date Extracted: 08/3/17

Duplicate Matrix Spike Summary
Total Metals

Sample Name: Batch QC **Units:** mg/Kg
Lab Code: K1707930-001 **Basis:** Dry

Analysis Method: 7471B

Prep Method: Method

Analyte Name	Matrix Spike KQ1710724-04					Duplicate Matrix Spike KQ1710724-05				
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Mercury	0.005 J	0.480	0.497	96	0.495	0.495	99	80-120	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Analyzed: 08/09/17

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1710703-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6010C	6100	7930	77	39-161
Barium	6010C	330	308	107	74-126
Copper	6010C	111	106	105	75-125
Iron	6010C	12200	14400	85	36-164
Manganese	6010C	409	410	100	76-124
Zinc	6010C	188	191	99	70-130

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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Analyzed: 08/03/17

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1710703-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Antimony	6020A	63.5	105	61	20-254
Arsenic	6020A	97.4	98.5	99	69-145
Beryllium	6020A	66.9	66.0	101	74-126
Cadmium	6020A	151	146	103	73-127
Chromium	6020A	180	182	99	71-130
Cobalt	6020A	162	162	100	74-125
Lead	6020A	139	130	107	72-127
Nickel	6020A	148	149	99	73-127
Selenium	6020A	156	154	101	68-132
Silver	6020A	43.3	40.9	106	66-134
Thallium	6020A	187	175	107	69-131
Vanadium	6020A	89.2	96.7	92	65-135

ALS Group USA, Corp.
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QA/QC Report

Client: AMEC Foster Wheeler E & I (Geomatrix)
Project: Leviathan Mine RI/FS/0013091150
Sample Matrix: Soil

Service Request: K1707937
Date Analyzed: 08/04/17

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1710724-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Mercury	7471B	6.91	7.10	97	51-149